CLAIMS

1. An electro-optic integrated circuit comprising:
an integrated circuit substrate;
at least one optical signal providing element; and
at least one discrete reflecting optical element, mounted onto said integrated circuit substrate, cooperating with said at least one optical signal providing element and being operative to direct light from said at least one optical signal providing element.

2. An electro-optic integrated circuit comprising:
an integrated circuit substrate;
at least one optical signal receiving element; and
at least one discrete reflecting optical element mounted onto said integrated circuit substrate and cooperating with said at least one optical signal receiving element and being operative to direct light to said at least one optical signal receiving element.

3. An electro-optic integrated circuit comprising:
an integrated circuit substrate defining a planar surface;
at least one optical signal providing element; and
at least one reflecting optical element having an optical axis which is neither parallel nor perpendicular to said planar surface, said element cooperating with said at least one optical signal providing element and being operative to direct light from said at least one optical signal providing element.

4. An electro-optic integrated circuit according to claim 3 and wherein said at least one reflecting optical element includes a flat reflective surface.

5. An electro-optic integrated circuit according to claim 3 and wherein said at least one reflecting optical element includes a concave mirror.

6. An electro-optic integrated circuit according to claim 3 and wherein said at least one reflecting optical element includes a partially flat and partially concave mirror.

7. An electro-optic integrated circuit according to claim 6 and wherein said partially concave mirror includes a mirror with multiple concave reflective surfaces.

8. An electro-optic integrated circuit according to claim 3 and wherein said at least one reflecting optical element includes reflective elements formed on opposite surfaces of an optical substrate.

9. An electro-optic integrated circuit according to claim 8 and wherein at least one of said reflective elements includes a flat reflective surface.

10. An electro-optic integrated circuit according to claim 8 and wherein at least one of said reflective elements includes a concave mirror.

11. An electro-optic integrated circuit according to claim 8 and wherein at least one of said reflective elements includes a partially flat and partially concave mirror.

12. An electro-optic integrated circuit according to claim 11 and wherein said partially concave mirror includes a mirror with multiple concave reflective surfaces.

13. An electro-optic integrated circuit according to claim 3 and wherein said at least one reflecting optical element is operative to focus light received from said at least one optical signal providing element.

14. An electro-optic integrated circuit according to claim 3 and wherein said at least one reflecting optical element is operative to collimate light received from said

at least one optical signal providing element.

15. An electro-optic integrated circuit according to claim 3 and wherein said at least one reflecting optical element is operative to collimate at least one of multiple colors of light received from said at least one optical signal providing element.

16. An electro-optic integrated circuit according to claim 3 and wherein said at least one optical signal providing element comprises an optical fiber.

17. An electro-optic integrated circuit according to claim 3 and wherein said at least one optical signal providing element comprises a laser diode.

18. An electro-optic integrated circuit according to claim 3 and wherein said at least one optical signal providing element comprises a waveguide.

19. An electro-optic integrated circuit according to claim 3 and wherein said at least one optical signal providing element is operative to convert an electrical signal to an optical signal.

20. An electro-optic integrated circuit according to claim 3 and wherein said at least one optical signal providing element is operative to transmit an optical signal.

21. An electro-optic integrated circuit according to claim 3 and wherein said at least one optical signal providing element also comprises an optical signal receiving element.

22. An electro-optic integrated circuit according to claim 3 and wherein said at least one optical signal providing element is operative to generate an optical signal.

23. An electro-optic integrated circuit according to claim 3 and also comprising at least one optical signal receiving element, said at least one reflecting

optical element cooperating with said at least one optical signal receiving element and being operative to direct light to said at least one optical signal receiving element.

24. An electro-optic integrated circuit according to claim 23 and wherein said at least one optical signal receiving element comprises an optical fiber.

25. An electro-optic integrated circuit according to claim 23 and wherein said at least one optical signal receiving element comprises a diode detector.

26. An electro-optic integrated circuit according to claim 23 and wherein said at least one optical signal receiving element is operative to convert an optical signal to an electrical signal.

27. An electro-optic integrated circuit according to claim 23 and wherein said at least one optical signal receiving element is operative to transmit an optical signal.

28. An electro-optic integrated circuit according to claim 23 and wherein said at least one optical signal receiving element also comprises an optical signal providing element.

29. An electro-optic integrated circuit comprising:

an integrated circuit substrate defining a planar surface;

at least one optical signal receiving element; and

at least one reflecting optical element having an optical axis which is neither parallel nor perpendicular to said planar surface, said element cooperating with said at least one optical signal receiving element and being operative to direct light to said at least one optical signal receiving element.

30. An electro-optic integrated circuit according to claim 29 and wherein said at least one reflecting optical element includes a reflective grating.

31. An electro-optic integrated circuit according to claim 29 and wherein said at least one reflecting optical element includes reflective elements formed on opposite surfaces of an optical substrate.

32. An electro-optic integrated circuit according to claim 31 and wherein at least one of said reflective elements includes a reflective grating.

33. An electro-optic integrated circuit according to claim 29 and wherein said at least one reflecting optical element is operative to focus light received by said at least one optical signal receiving element.

34. An electro-optic integrated circuit according to claim 29 and wherein said at least one reflecting optical element is operative to focus at least one of multiple colors of light received by said at least one optical signal receiving element.

35. An electro-optic integrated circuit according to claim 29 and wherein said at least one optical signal receiving element comprises an optical fiber.

36. An electro-optic integrated circuit according to claim 29 and wherein said at least one optical signal receiving element is operative to convert an optical signal to an electrical signal.

37. A method for producing an electro-optic integrated circuit comprising:

providing an integrated circuit substrate;

mounting at least one optical signal providing element onto said integrated circuit substrate;

mounting at least one optical signal receiving element onto said integrated circuit substrate; and

providing optical alignment, between said at least one optical signal providing element and said at least one optical signal receiving element, subsequent to mounting thereof, by suitably positioning along an optical path extending therebetween,

at least one intermediate optical element and fixing said at least one intermediate optical element to said integrated circuit substrate.

38. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one intermediate optical element includes a flat reflective surface.

39. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one intermediate optical element includes a concave mirror.

40. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one intermediate optical element includes a partially flat and partially concave mirror.

41. A method for producing an electro-optic integrated circuit according to claim 40 and wherein said partially concave mirror includes a mirror with multiple concave reflective surfaces.

42. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one intermediate optical element includes a reflective grating.

43. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one intermediate optical element includes reflective elements formed on opposite surfaces of an optical substrate.

44. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one intermediate optical element is operative to focus light received from said at least one optical signal providing element by said at least one optical signal receiving element.

45. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one intermediate optical element is operative to collimate light received from said at least one optical signal providing element by said at least one optical signal receiving element.

46. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one intermediate optical element is operative to focus at least one of multiple colors of light received from said at least one optical signal providing element by said at least one optical signal receiving element.

47. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one intermediate optical element is operative to collimate at least one of multiple colors of light received from said at least one optical signal providing element by said at least one optical signal receiving element.

48. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one optical signal providing element is operative to convert an electrical signal to an optical signal.

49. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one optical signal providing element is operative to transmit an optical signal.

50. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one optical signal providing element also comprises an optical signal receiving element.

51. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one optical signal providing element is operative to generate an optical signal.

52. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one optical signal receiving element is operative to convert an optical signal to an electrical signal.

53. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one optical signal receiving element is operative to transmit an optical signal.

54. A method for producing an electro-optic integrated circuit according to claim 37 and wherein said at least one intermediate optical element, when fixed to said substrate, has an optical axis which is neither parallel nor perpendicular to a planar surface of said integrated circuit substrate.

55. A method for producing an electro-optic integrated circuit comprising:

providing an integrated circuit substrate;

mounting at least one optical signal providing element on said integrated circuit substrate; and

mounting at least one discrete reflecting optical element onto said integrated circuit substrate to cooperate with said at least one optical signal providing element and to direct light from said at least one optical signal providing element.

56. A method for producing an electro-optic integrated circuit comprising:

providing an integrated circuit substrate;

mounting at least one optical signal receiving element on said integrated circuit substrate; and

mounting at least one discrete reflecting optical element onto said integrated circuit substrate to cooperate with said at least one optical signal receiving element and to direct light to said at least one optical signal receiving element.

57. A method for producing an electro-optic integrated circuit comprising:

providing an integrated circuit substrate defining a planar surface;

mounting at least one optical signal providing element on said integrated circuit substrate; and

mounting at least one reflecting optical element onto said integrated circuit substrate to cooperate with said at least one optical signal providing element and to direct light from said at least one optical signal providing element,

wherein an optical axis of said at least one reflecting optical element is neither parallel nor perpendicular to said planar surface.

58. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one reflecting optical element includes a flat reflective surface.

59. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one reflecting optical element includes a concave mirror.

60. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one reflecting optical element includes a partially flat and partially concave mirror.

61. A method for producing an electro-optic integrated circuit according to claim 60 and wherein said partially concave mirror includes a mirror with multiple concave reflective surfaces.

62. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one reflecting optical element includes a reflective grating.

63. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one reflecting optical element includes reflective

elements formed on opposite surfaces of an optical substrate.

64. A method for producing an electro-optic integrated circuit according to claim 63 and wherein at least one of said reflective elements includes a flat reflective surface.

65. A method for producing an electro-optic integrated circuit according to claim 63 and wherein at least one of said reflective elements includes a concave mirror.

66. A method for producing an electro-optic integrated circuit according to claim 63 and wherein at least one of said reflective elements includes a partially flat and partially concave mirror.

67. A method for producing an electro-optic integrated circuit according to claim 66 and wherein said partially concave mirror includes a mirror with multiple concave reflective surfaces.

68. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one reflecting optical element is operative to focus light received from said at least one optical signal providing element.

69. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one reflecting optical element is operative to collimate light received from said at least one optical signal providing element.

70. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one reflecting optical element is operative to collimate at least one of multiple colors of light received from said at least one optical signal providing element.

71. A method for producing an electro-optic integrated circuit according to

claim 57 and wherein said at least one optical signal providing element comprises an optical fiber.

72. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one optical signal providing element comprises a laser diode.

73. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one optical signal providing element comprises a waveguide.

74. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one optical signal providing element is operative to convert an electrical signal to an optical signal.

75. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one optical signal providing element is operative to transmit an optical signal.

76. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one optical signal providing element also comprises an optical signal receiving element.

77. A method for producing an electro-optic integrated circuit according to claim 57 and wherein said at least one optical signal providing element is operative to generate an optical signal.

78. A method for producing an electro-optic integrated circuit according to claim 57 and also comprising mounting at least one optical signal receiving element on said integrated circuit substrate, said at least one reflecting optical element cooperating with said at least one optical signal receiving element and being operative to direct light

to said at least one optical signal receiving element.

79. A method for producing an electro-optic integrated circuit according to claim 78 and wherein said at least one optical signal receiving element comprises an optical fiber.

80. A method for producing an electro-optic integrated circuit according to claim 78 and wherein said at least one optical signal receiving element comprises a diode detector.

81. A method for producing an electro-optic integrated circuit according to claim 78 and wherein said at least one optical signal receiving element is operative to convert an optical signal to an electrical signal.

82. A method for producing an electro-optic integrated circuit according to claim 78 and wherein said at least one optical signal receiving element is operative to transmit an optical signal.

83. A method for producing an electro-optic integrated circuit according to claim 78 and wherein said at least one optical signal receiving element also comprises an optical signal providing element.

84. A method for producing an electro-optic integrated circuit comprising:

providing an integrated circuit substrate defining a planar surface;

mounting at least one optical signal receiving element on said integrated circuit substrate; and

mounting at least one reflecting optical element onto said integrated circuit substrate to cooperate with said at least one optical signal receiving element and to direct light to said at least one optical signal receiving element,

wherein an optical axis of said at least one reflecting optical element is neither parallel nor perpendicular to said planar surface.

85. A method for producing an electro-optic integrated circuit according to claim 84 and wherein said at least one reflecting optical element includes a reflective grating.

86. A method for producing an electro-optic integrated circuit according to claim 84 and wherein said at least one reflecting optical element includes reflective elements formed on opposite surfaces of an optical substrate.

87. A method for producing an electro-optic integrated circuit according to claim 86 and wherein at least one of said reflective elements includes a reflective grating.

88. A method for producing an electro-optic integrated circuit according to claim 84 and wherein said at least one reflecting optical element is operative to focus light received by said at least one optical signal receiving element.

89. A method for producing an electro-optic integrated circuit according to claim 84 and wherein said at least one reflecting optical element is operative to focus at least one of multiple colors of light received by said at least one optical signal receiving element.

90. A method for producing an electro-optic integrated circuit according to claim 84 and wherein said at least one optical signal receiving element comprises an optical fiber.

91. A method for producing an electro-optic integrated circuit according to claim 84 and wherein said at least one optical signal receiving element is operative to convert an optical signal to an electrical signal.

92. An integrated circuit comprising:

a first integrated circuit substrate having first and second planar surfaces, said first planar surface having first electrical circuitry formed thereon and said second planar surface having formed therein at least one recess; and

at least one second integrated circuit substrate having second electrical circuitry formed thereon, said at least one second integrated circuit substrate being located at least partially in said at least one recess, said second electrical circuitry communicating with said first electrical circuitry.

93. An integrated circuit according to claim 92 and wherein said first electrical circuitry includes electro-optic components.

94. An integrated circuit according to claim 92 and wherein said second electrical circuitry includes electro-optic components.

95. An integrated circuit according to claim 92 and wherein said second electrical circuitry communicating with said first electrical circuitry includes communicating via an optical communication path.

96. An integrated circuit according to claim 95 and wherein said optical communication path includes optical coupling through free space.

97. An integrated circuit comprising:

a first integrated circuit substrate having first and second planar surfaces, said first planar surface having first electrical circuitry formed thereon and said second planar surface having formed therein at least one recess; and

at least one second substrate, said at least one second substrate being located at least partially in said at least one recess, said second substrate containing at least one element communicating with said first electrical circuitry.

98. A method for producing an integrated circuit comprising:

providing a first integrated circuit substrate, with first and second planar

surfaces;

forming first electrical circuitry on said first planar surface;

forming at least one recess in said second planar surface;

providing at least one second integrated circuit substrate;

forming second electrical circuitry on said at least one second integrated circuit substrate; and

locating said at least one second integrated circuit substrate at least partially in said at least one recess, said second electrical circuitry communicating with said first electrical circuitry.

99. A method for producing an integrated circuit according to claim 98 and wherein said first electrical circuitry includes electro-optic components.

100. A method for producing an integrated circuit according to claim 98 and wherein said second electrical circuitry includes electro-optic components.

101. A method for producing an integrated circuit according to claim 98 and wherein said second electrical circuitry communicating with said first electrical circuitry includes communicating via an optical communication path.

102. A method for producing an integrated circuit according to claim 101 and wherein said optical communication path includes optical coupling through free space.

103. A method for producing an integrated circuit comprising:

providing a first integrated circuit substrate;

forming first electrical circuitry on said first substrate;

forming at least one recess in said first substrate;

providing at least one second integrated circuit substrate;

forming second electrical circuitry on said at least one second integrated circuit substrate; and

locating said at least one second integrated circuit substrate at least

partially in said at least one recess, said second electrical circuitry communicating with said first electrical circuitry.

104. A method for producing an integrated circuit according to claim 103 and wherein said first electrical circuitry includes electro-optic components.

105. A method for producing an integrated circuit according to claim 103 and wherein said second electrical circuitry includes electro-optic components.

106. A method for producing an integrated circuit according to claim 103 and wherein said second electrical circuitry communicating with said first electrical circuitry includes communicating via an optical communication path.

107. A method for producing an integrated circuit according to claim 106 and wherein said optical communication path includes optical coupling through free space.

108. A method for producing an integrated circuit comprising:

providing a first integrated circuit substrate, with first and second planar surfaces;

forming first electrical circuitry on said first planar surface;

forming at least one recess in said second planar surface;

providing at least one second substrate; and

locating said at least one second substrate at least partially in said at least one recess, said second substrate containing at least one element communicating with said first electrical circuitry.

109. An integrated circuit comprising:

a silicon integrated circuit substrate having electrical signal processing circuitry formed thereon and at least one discrete optical element mounted thereon,

said electrical signal processing circuitry including an electrical signal input and an electrical signal output and

said at least one discrete optical element including an optical input and an optical output.

110. An integrated circuit according to claim 109 and wherein said optical element is operative to convert said electrical signal output into said optical input.

111. An integrated circuit according to claim 109 and wherein said electrical signal processing circuitry is operative to convert said optical output into said electrical signal input.

112. An integrated circuit according to claim 109 and wherein said electrical signal processing circuitry and said discrete optical element are located on a single planar surface of said substrate.

113. An integrated circuit according to claim 109 and wherein said electrical signal processing circuitry and said discrete optical element are located on different planar surfaces of said substrate.

114. A method for producing an integrated circuit comprising:

providing a silicon integrated circuit substrate;

forming electrical signal processing circuitry on said substrate; and

mounting at least one discrete optical element on said substrate,

said electrical signal processing circuitry including an electrical signal input and an electrical signal output and

said at least one discrete optical element including an optical input and an optical output.

115. A method for producing an integrated circuit according to claim 114 and wherein said optical element is operative to convert said electrical signal output into said optical input.

116. A method for producing an integrated circuit according to claim 114 and wherein said electrical signal processing circuitry is operative to convert said optical output into said electrical signal input.

117. A method for producing an integrated circuit according to claim 114 and wherein said electrical signal processing circuitry and said discrete optical element are located on a single planar surface of said substrate.

118. A method for producing an integrated circuit according to claim 114 and wherein said electrical signal processing circuitry and said discrete optical element are located on different planar surfaces of said substrate.

119. An optical connector comprising a plurality of optical elements defining at least one optical input path and at least one optical output path, said at least one optical input path and said at least one optical output path being non-coaxial.

120. An optical connector according to claim 119 and wherein at least one of said plurality of optical elements includes a concave mirror.

121. An optical connector according to claim 119 and wherein at least one of said plurality of optical elements includes a mirror with multiple concave reflective surfaces.

122. An optical connector according to claim 119 and wherein at least one of said plurality of optical elements includes a reflective grating.

123. An optical connector according to claim 119 and wherein at least one of said plurality of optical elements includes reflective elements formed on opposite surfaces of an optical substrate.

124. An optical connector according to claim 119 and wherein at least one of

said plurality of optical elements is operative to focus light.

125. An optical connector according to claim 119 and wherein at least one of said plurality of optical elements is operative to collimate light.

126. An optical connector according to claim 119 and wherein at least one of said plurality of optical elements is operative to focus at least one of multiple colors of light.

127. An optical connector according to claim 119 and wherein at least one of said plurality of optical elements is operative to collimate at least one of multiple colors of light.

128. A method for producing an optical connector comprising:

providing a plurality of optical elements;

defining at least one optical input path through at least one of said plurality of optical elements; and

defining at least one optical output path through at least one of said plurality of optical elements,

said at least one optical input path and said at least one optical output path being non-coaxial.

129. A method for producing an optical connector according to claim 128 and wherein at least one of said plurality of optical elements includes a concave mirror.

130. A method for producing an optical connector according to claim 128 and wherein at least one of said plurality of optical elements includes a mirror with multiple concave reflective surfaces.

131. A method for producing an optical connector according to claim 128 and wherein at least one of said plurality of optical elements includes a reflective grating.

132. A method for producing an optical connector according to claim 128 and wherein at least one of said plurality of optical elements includes reflective elements formed on opposite surfaces of an optical substrate.

133. A method for producing an optical connector according to claim 128 and wherein at least one of said plurality of optical elements is operative to focus light.

134. A method for producing an optical connector according to claim 128 and wherein at least one of said plurality of optical elements is operative to collimate light.

135. A method for producing an optical connector according to claim 128 and wherein at least one of said plurality of optical elements is operative to focus at least one of multiple colors of light.

136. A method for producing an optical connector according to claim 128 and wherein at least one of said plurality of optical elements is operative to collimate at least one of multiple colors of light.

137. An optical reflector comprising:
an optical substrate;
at least one microlens formed on a surface of said optical substrate; and
a first reflective surface formed over said at least one microlens.

138. An optical reflector according to claim 137 and wherein said first reflective surface is also formed over at least a portion of said surface of said optical substrate.

139. An optical reflector according to claim 137 and also comprising at least one second reflective surface formed on at least a portion of an opposite surface of said substrate.

140. An optical reflector according to claim 137 and wherein at least a portion of said first reflective surface comprises a grating.

141. An optical reflector according to claim 139 and wherein at least a portion of said second reflective surface comprises a grating.

142. An optical reflector according to claim 137 and also comprising a notch formed in said opposite surface of said substrate.

143. An optical reflector according to claim 139 and also comprising a notch formed in said opposite surface of said substrate.

144. An optical reflector according to claim 137 and wherein said at least one microlens is formed by photolithography and thermal reflow forming.

145. An optical reflector according to claim 137 and wherein said at least one microlens is formed by photolithography using a grey scale mask forming.

146. An optical reflector according to claim 137 and wherein said at least one microlens is formed by jet printing formation.

147. An optical reflector according to claim 137 and wherein said at least one microlens has an index of refraction which closely approximates that of said optical substrate.

148. A method for producing an optical reflector comprising:
providing an optical substrate;
forming at least one microlens on a surface of said optical substrate;
coating said at least one microlens with a reflective material; and
dicing said substrate.

149. A method for producing an optical reflector according to claim 148 and wherein said coating also comprises coating at least a portion of said surface of said substrate.

150. A method for producing an optical reflector according to claim 148 and also comprising coating at least a portion of an opposite surface of said substrate with a reflective material prior to dicing said substrate.

151. A method for producing an optical reflector according to claim 148 and also comprising forming a grating on at least a portion of said surface prior to coating thereof.

152. A method for producing an optical reflector according to claim 150 and also comprising forming a grating on at least a portion of said opposite surface prior to coating thereof.

153. A method for producing an optical reflector according to claim 148 and also comprising forming a notch in an opposite surface of said substrate prior to dicing said substrate.

154. A method for producing an optical reflector according to claim 150 and also comprising forming a notch in an opposite surface of said substrate prior to dicing said substrate.

155. A method for producing an optical reflector according to claim 148 and wherein said forming comprises photolithography and thermal reflow forming.

156. A method for producing an optical reflector according to claim 148 and wherein said forming comprises photolithography using a grey scale mask forming.

157. A method for producing an optical reflector according to claim 148 and wherein said forming comprises jet printing formation.

158. A method for producing an optical reflector according to claim 148 and wherein said at least one microlens has an index of refraction which closely approximates that of said optical substrate.

159. A packaged electro-optical integrated circuit having integrally formed therein an optical connector to an optical fiber.

160. A packaged electro-optical integrated circuit according to claim 159 and wherein said optical connector comprises a pair of elongate locating pin sockets formed over a silicon substrate of said integrated circuit, and extending generally parallel to a surface thereof.

161. A packaged electro-optical integrated circuit according to either of claims 159 and 160 and wherein said optical connector comprises a linear array of optical fiber ends arranged to have abutment surfaces generally coplanar with an edge of said packaged electro-optical integrated circuit.

162. A method for wafer scale production of an electro-optic circuit having integrally formed therein an optical connector and electrical connections comprising:

wafer scale formation of a multiplicity of electro-optical circuits onto a substrate;

wafer scale provision of at least one optical waveguide on said substrate;

wafer scale mounting of at least one integrated circuit component onto said substrate;

wafer scale formation of at least one optical pathway providing an optical connection between said at least one integrated circuit component and said at least one optical waveguide;

wafer scale formation of at least one mechanical alignment bore on said

substrate;

wafer scale formation of at least one packaging layer over at least one surface of said substrate; and

thereafter, dicing of said substrate to define a multiplicity of electro-optic circuits, each having integrally formed therein an optical connector.

163. A method according to claim 162 and wherein an end of said at least one optical waveguide defines an optical connector interface.

164. A method for wafer scale production of an electro-optical circuit according to claim 162 and wherein said substrate comprises a silicon substrate having formed thereon a multiplicity of integrated circuits.

165. A method of mounting an integrated circuit onto an electrical circuit comprising:

forming an integrated circuit with a multiplicity of electrical connection pads which generally lie along a mounting surface of the integrated circuit;

forming an electrical circuit with a multiplicity of electrical connection contacts which generally protrude from a mounting surface of the electrical circuit; and

employing at least a conductive adhesive to electrically and mechanically join said multiplicity of electrical connection pads to said multiplicity of electrical connection contacts.

166. A method according to claim 165 wherein said integrated circuit is an electro-optical circuit, and the method also comprises providing an optically transparent underfill layer intermediate said mounting surface of said integrated circuit and said mounting surface of said electrical circuit.

167. A method for wafer scale production of an electro-optical circuit comprising:

wafer scale formation of a multiplicity of electro-optical circuits onto an

active surface of a substrate; and

wafer scale provision of at least one optical via on said substrate.

168. A method for wafer scale production of an electro-optical circuit according to claim 167 and wherein said wafer scale provision of said at least one optical via comprises:

etching said substrate on a non-active surface thereof at a location opposite a region of said active surface generally free of circuitry, thereby to define at least one cavity whose bottom surface is translucent; and

filling said at least one cavity with a transparent material.

169. A method for wafer scale production of an electro-optical circuit according to either of claims 167 and 168 and also comprising attaching a semiconductor element in optical engagement with said at least one optical via.

170. A method for wafer scale production of an electro-optical circuit according to claim 168 and wherein said transparent material has an index of refraction similar to that employed along at least one optical path in said electro-optical circuit communicating therewith.

171. A method for wafer level production of a electro-optical circuit comprising:

forming electrical circuitry on a first side of a wafer;

forming an optical assembly on a second side of said wafer; and

forming an optical connection between said first and second sides of said wafer, through said wafer, thereby providing optical communication between said electrical circuitry and said optical assembly through said wafer.

172. A method for wafer level production of an electro-optical circuit according to claim 171 and also comprising dicing said wafer to define a multiplicity of integrated circuits each having formed thereon electrical circuitry on a first side of said

integrated circuit, an optical assembly on a second side of said integrated circuit and an optical connection between said first and second sides of said integrated circuit, thereby providing optical communication between said electrical circuitry and said optical assembly.